

ABSTRACT

Tissue substance measurement systems are arranged with highly specialized optical sources. Quantum cascade lasers are high power semiconductor lasers which are
5 tiny in size and highly tunable with respect to wavelength. When deployed in non-invasive tissue substance measurement systems, quantum cascade lasers offer system advantages such as high accuracy, small size, convenience, efficiency, among others. These specialized semiconductors may be used with systems based upon photoacoustic principles. Systems may be formed of a plurality of quantum cascade laser in an optical
10 source, mechanism to couple light into tissue, an acoustic detector and a signal processor. In some versions, user interfaces provide a reporting and feedback function to a user.